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Terrestrial invertebrate fauna of Polish caves – a summary of 100 years of research

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Abstract

The year 2018 is particularly important in the history of zoological research in Poland. A hundred years ago, Kazimierz Demel published the first work concerning the terrestrial cave fauna of caves in the Ojców area. In this paper we present the extent of research on the terrestrial invertebrate fauna of Polish caves in the last 100 years. All accessible research papers that have been published during this period were analysed. Based on published literature, 593 species of terrestrial invertebrate were recorded in Polish caves. Additionally, detailed list of species of individual taxonomic groups was provided.

Keywords

subterranean fauna, terrestrial, invertebrate, checklist, caves, Poland

Introduction

The year 2018 is particularly important in the history of zoological research conducted in our country as it closes a period of 100 years of research on terrestrial invertebrates inhabiting the caves of Poland. A hundred years ago, Kazimierz Demel published the first groundbreaking work concerning the fauna of caves in the Ojców area. Although many works regarding Poland's cave fauna have been published in the last 100 years, it is still of marginal research interest to Polish zoologists, ecologists or general biologists. The aim of this paper is to present the entire range of research on the terrestrial invertebrate fauna of Polish caves in the last 100 years.

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Materials and methods

All accessible research papers regarding the terrestrial invertebrate fauna of Polish caves that were published in the last 100 years were analysed in this article. These include the accessible papers published as monographs, original research papers, notes and conference materials. The results were presented here as a historical overview of the research, a list of references and a list of proven invertebrate species. The generic names have been provided regarding taxonomic indexes Fauna Europaea https://fauna-eu.org and World Spider Catalog https://wsc.nmbe.ch.

Results

Historical overview of the research

The beginning of interest in the terrestrial fauna of Polish caves dates back to the first years of the 20th century when Kazimierz Demel conducted his pioneer research in 1914. Unfortunately, the First World War prevented him from processing and issuing the results, which were actually published in 1918. Demel presented the fauna inhabiting eight caves of the Ojców area (southern part of Kraków-Częstochowa Upland), i.e. Jaskinia Koziarnia, Jaskinia Pustelnia, Jaskinia Biała, Jaskinia Złodziejska, Jaskinia Zbójecka, Jaskinia Łokietka, Jaskinia Ciemna and Jaskinia Jerzmanowska. Despite the period devoted to the research being relatively short (two and a half months), Demel collected a vast number of invertebrates, and in the presented results listed 30 species of invertebrates, 11 of which were described as cave forms, although they could be observed outside of caves (contemporarily named as troglophiles). In his works, Demel compared his results to the ones already presented by the cave fauna researchers from Germany, Belgium, France and Austria, giving attention to faunal similarities with other caves. In the papers of the above-mentioned author, one can find both: a list of species and data concerning cave environment observations, i.e. temperature, humidity, light coverage and access to degrading organic matter, which enabled the author to perform ecological analyses.

Based on the material compiled by Demel, Stach (1919) proved the presence of five species of springtails, including description of one species new to science, i.e. *Mesachorutes ojcovensis*. The author also compared the Polish springtail fauna to that of other European countries and confirmed Demel's assumptions that troglobionts are scarce in Polish caves. Furthermore, the data concerning springtail species found in Polish caves were summarised by Stach (1947–1963).

In the 1920s, Arndt (1921, 1923) published two papers based on his research in a few caves and mines (e.g. Złota Sztolnia) in Sudety Mountains. Nowadays most of these mines are located in the Czech Republic, while others, i.e. Niedźwiedzia Jama or Solna Jama, in Poland. Despite the research was conducted only from March to October 1920, Arndt proved the presence of 42 invertebrate species (including stygobiotic

ones) and recognised the *Schaefferia emucronata* springtail as a troglobiont species. He noticed that the fauna of the Sudety Mountains lacks the species typical to the caves of Harz Mountains, Central Alps and Urals, i.e. blind beetles (Coleoptera), Orthoptera and Acari. In the second paper, Arndt (1923) supplemented the information on ecological groups and faunal genesis in the examined subterranean sites.

Other papers devoted to the cave-dwelling fauna of the Sudety Mountains were published by Pax and Maschke (1935) and Pax (1937). The object of the research was both terrestrial and aquatic fauna in the Rogóżka Cave. The research, which began in 1933, was focused not only on the cave fauna but also on the environmental conditions, i.e. the physical and chemical properties of the lake water, and the air temperature. Nowadays the Rogóżka Cave is the non-existed cave, in 1962 it was partly destroyed by mining in the crystalline limestones quarry, and next the entrance was covered by stones (Bieroński et al. 2009).

The Second World War delayed the faunal research in Polish caves for a few years. The first post-war researcher who was interested in cave-dwelling invertebrate fauna was Kazimierz Kowalski, who presented the results of his biological observations and the research project on the Tatra Mountains caves for the years 1951–1952 in the "Wierchy" annual. In 1955, he published a paper with the results of the above-mentioned research. During his research, he visited all known Tatra caves, but his main research interest was in six caves, i.e. Jaskinia Dziura Wyżnia, Jaskinia Zimna, Jaskinia Groby, Jaskinia Magurska, Jaskinia Lodowa and Jaskinia Dziura. His methodology included not only the faunal collection by means of Barber traps or direct search methods, but also microclimate analyses, i.e. light influence and air movement. Kowalski did not limit his research to the invertebrate fauna, as it included also bats. In his work, the characteristics of the research area and detailed descriptions of microclimate conditions can be found.

In the following decades, i.e. in the 60s and 70s of the 20th century, Skalski presented exceptional research activity in the field of cave-dwelling fauna. He published his first work together with Wójcik (Skalski and Wójcik 1968), where they presented faunal genesis and microclimate characteristics of selected caves of the Częstochowa area. They proved the presence of six troglobiont species i.e. *Mesachorutes ojcoviensis*, *Catops tristis infernus*, *Choleva lederiana gracilenta*, *Porrhomma egeria*, *Arrhopalites pygmeus*, *Onychiurus alborufescens* and also determined the geographical distribution of these species.

The subsequent works by Skalski (1967, 1969) were dedicated to invertebrate fauna in the Tatra Mountains. In addition to the presented list of species, he also considered the relationship between the age of the cave and the number of troglobionts as an important factor influencing the species variety. Furthermore, he presented detailed information about the occurrence of *Onychiurus armatus* springtails in the Mylna and Czarna caves, *Hypena obsitalis* butterflies in the Mylna cave and *Exephanes ischioxanthus* hymenoptera in Szczelina Chochołowska.

In 1973, Skalski published an extensive paper on the research and observations conducted in the years 1957–1970 in 19 caves of the Częstochowa Upland. Using a

wide range of entomological methods (Barber traps, Tullgren funnels, entomological sieves and direct searches), he detected 83 species belonging to a few arthropod and molluscan orders. He extensively discussed ecological issues, also concerning troglo-xenes, for example he paid special attention to describing the associations of arthropods living or resting on cave walls. The paper includes valuable data on reproduction, position and spread of individual species in the caves like characteristics of massive occurrence of *Choleva lederiana gracilenta* if there is high availability of food.

Apart from the above mentioned research published in the form of papers, presentations at Speleological Conferences, which have been taking place since 1965, give an update on the invertebrate cave fauna research. The first information can be found in the materials form 3rd/4th Speleological Conference (1971), where Skalski (1971) presented overview of terrestrial and aquatic fauna, named all the known species and compared the knowledge from various Polish cave regions.

In his subsequent paper, Skalski (1981) focused on known data of invertebrate fauna again. However, he put particular emphasis on dominant groups and tried to determine the reasons for underground sites colonisation. He emphasised the primary dominance of not only insects and springtails in the caves but also spiders, and analysed the conditions favourable to cave organisms, i.e. food accessibility and cave habitat as a shelter for fauna during the winter.

In 1975, Baranek and Powichrowski published an article about the cave fauna in Dolina Wodącej. Three caves of the valley, Jaskinia Źródlana (Psia), Jasknia Zegarowa and Jaskinia Mroczna, were discussed in the paper. The authors observed the associations of arthropods trogloxenes like numerous fly community, spiders (particularly *Meta* sp.) and other arachnids on the cave walls. Springtails and beetles of families Staphylinidae and Catopidae (Leiodidae) were recognised among the regular cave-dwelling species. The only troglobiont species recorded was *Porhomma moravicum* (currently *P. egeria*), which was observed in Jaskinia Mroczna.

Sanocka-Wołoszynowa (1981) on Kraków – Częstochowa Upland arachnids study added great value to the state of knowledge of invertebrate fauna exploration. The author examined 184 caves and shelters; 40 of them were examined in all four seasons. Samples were collected by means of Barber traps or direct search. As a result, 13000 specimens representing 186 species of spiders, arachnids and pseudoscorpions were collected. Two species of spiders recorded deserve special attention: troglobiontic *Porhomma egeria* (in the paper *P. moravicum*) and troglophilic *Meta menardi*. Among arachnids also harvestman *Ischyropsalis helwigii*, known earlier from the Sudety Mountains area, the observation of which in Kraków – Częstochowa Upland widened the range of its occurrence. The author in addition to the detailed list of species, carried out an ecological and zoocoenological analysis, for example, she distinguished communities of arachnids living in the litter, associations of wall arachnids and a deep-cave group of species with dominant species *Porrhomma egeria*.

At the 15th Speleological Conference, Sobiepanek (1985) described the results of the research conducted during Tatra Mountains caves inventory. During the research, the samples were collected by direct search or by means of Barber traps. As a result,

many taxa belonging to dipterans, beetles, trichopterans, millipedes, spiders, gastropods, springtails and earthworms were observed. During the 30th Speleological Conference, Gubała (1996) presented his paper about the results of an inventory of 131 caves and shelters in świętokrzyskie region.

The end of the 20th century provided new data to particular systematic groups. Pomorski (1992) focused on the springtail fauna in the Sudety Mountains caves and mines. In his study, Pomorski detected 34 species, seven of which were classified as troglobionts i.e. *Bonetogastrura cavicola*, *Schaefferia emucronata*, *Oligaphorura schoetti*, *Onychiurus ambulans*, *Onychiurus cebennarius*, *Oncopodura reyersdorfensis*, *Arrhopalites bifidus* and 10 as troglophiles. Skalski (1994) noted the successful introduction of *Speonomus hydrophilus* to Jaskinia Dzwonnica in Wyżyna Częstochowska.

Further papers were published after the year 2000. The studies by Maślak and Barczyk (2011) and Barczyk and Madej (2014) were devoted to cave mites. The first article refers to *Oribatida* dwelling in five Jurassic caves, i.e. Jaskinia Nietoperzowa, Jaskinia Wierna, Jaskinia Studnisko, Jaskinia Błotna and Jaskinia Pod Porzeczką, and their immediate surroundings. The study presented an analysis of faunistic similarities between the species and caves. Altogether 65 Orbatida species, including one typically cave dwelling species, were recorded. It was proven that the faunal composition of larger caves significantly differs from smaller ones. Communities of small caves, such as Jaskinia Błotna, Jaskinia Pod Porzeczką were similar to soil fauna communities. The species composition was mainly influenced by the accessibility of particular food sources (leaves, guano, wood) (Maślak and Barczyk 2011). The second paper refers to eight caves of the Kraków – Częstochowa Upland (Jaskinia Lodowa, Jaskinia poniżej Lodowej, Jaskinia Pod Porzeczką, Jaskinia Studnisko, Jaskinia Pod Sokołą, Jaskinia Jasna, Jaskinia Błotna and Jaskinia Schronisko koło Jaskini Lodowej), where 316 samples were collected. There were 270 samples collected from the immediate surroundings of the caves. As a result, the author identified 106 species from 13 families, including four species new in Polish fauna i.e. *Paragamasus arcuatus*, *Parasitus hortivagus*, *Pachylaelaps sublongisetis*, *Pachyglobolaelaps hallidayi* and troglobiont species recognised earlier in other caves. Significant differences in species composition between Acari communities inhabiting caves and cave surroundings were described.

Among the contemporary studies devoted to invertebrate fauna, Dumnicka and Płotek (2013) discussed the differences in invertebrate fauna between the caves Jaskinia Towarna and Jaskinia Dzwonnica, with regards to microclimate conditions, organic matter content in the cave deposits and tourism intensity.

During the 49th Speleological Conference, Kocot – Zalewska (2015) presented the preliminary results of the research on Jaskinia Kroczycka fauna. The presentation included general data however indicated seven orders: butterflies, dipterans, spiders, beetles, trichopterans, mites and springtails. At the next Speleological Conference, Kocot – Zalewska (2016) presented the results of the observation of Jaskinia Towarna colonisation by *Speonomus normandi hydrophilus* of Leiodidae family. The beetle was introduced in the caves in 1982 and its natural place of occurrence is Arize Massif in Pyrenees.

In a contemporary paper, Kur et al. (2016) characterised the fauna of Jaskinia Szeptunów (Szmaragdowa). Based on the samples collected in the years 2005, 2006, 2010, 2014, 2015, 5 species of springtails, 2 species of Myriapoda, 1 spider species, 2 species of butterflies and mites were observed. The cave was opened in 1990 and the colonisation rate by living organisms was monitored.

At the 51st Speleological Conference, Kocot – Zalewska and Słupińska (2017) presented the discovery of a great population of *Choleva lederiana gracilenta*, which is endemic to Sokole Mountain caves, and presented detailed information about its quantity, sex ratio and cave positioning. During the same Speleological Conference, Dumnicka (2017) discussed the state of knowledge of invertebrate cave fauna of Polish Tatra Mountains based on literature data, mainly the works by Stach (1934, 1954) and Kowalski (1955).

Several short articles were devoted to interesting discoveries of invertebrate species found in caves (Dylewska and Błoszyk 2006, Kocot-Zalewska and Rozwałka 2018, Kasprzak 1973, Weiner 1990), however, several synthetic articles were also written, summarizing the state of knowledge and valorization of a valuable studied area (Błoszyk and Rozwałka 2008, Ochman 2004, Wołoszyn and Wójcik 1964).

Checklist of terrestrial invertebrate record in Polish caves

Based on published literature, 593 species of terrestrial invertebrate are recorded in Polish caves.

Insects are represented by 146 species. Respectively: Coleoptera 50 species, Diptera 60 species, Hymenoptera 18 species, Lepidoptera 10 species, Trichoptera 4 species, Siphonaptera 3 species, Thysanoptera 1 species. Detailed list of recorded species is presented in Table 1.

Table 1. The checklist of insects recorded in Polish caves.

Species	References
Coleoptera:	
Acidota cruentata Mannerheim, 1830	Ochman 2004, Skalski 1973a
Acrotrichis intermedia (Gillmeister, 1845) [= *Trichopteryx intermedia* ‡]	Pax and Maschke 1935
Aleochara diversa (J. Sahlberg, 1876)	Pax and Maschke 1935
Aphodius fimetarius (Linnaeus, 1758)	Pax and Maschke 1935
Apocatops nigrita (W.F. Erichson, 1837) [=*Catops nigrita* W.F. Erichson, 1837‡]	Pax and Maschke 1935
Atheta fungi (J.L.C. Gravenhorst, 1806)	Pax and Maschke 1935
Atheta trinotata (E.G. Kraatz, 1856)	Pax and Maschke 1935
Cantharis rustica C.F. Fallén, 1807	Pax and Maschke 1935
Catops alpinus Gyllenhal, 1827	Pax and Maschke 1935
Catops fuliginosus Erichson, 1837	Kowalski 1955
Catops fuscus (Panzer, 1794)	Pax and Maschke 1935
Catops longulus Kellner, 1846	Kowalski 1955, Pax and Maschke 1935
Catops subfuscus Kellner, 1846	Kowalski 1955, Pax and Maschke 1935, Skalski 1973a

Species	References
Catops tristis tristis (Panzer, 1794)	Kowalski 1955, Pax and Maschke 1935
Catops tristis infernus Szymczakowski, 1957	Ochman 2004, Skalski 1971, Skalski 1973a, Skalski 1973b, Skalski 1981, Skalski 1994-1995, Skalski 1994a, Skalski and Wójcik 1968, Szymczakowski 1957
Choleva agilis (Illiger, 1798)	Gubała 1996, Wołoszyn and Wójcik 1964
Choleva angustata (Fabricius, 1781)	Gubała 1996
Choleva cisteloides Frölich, 1799	Ochman 2004, Skalski 1973a
Choleva elongata (Paykull, 1798)	Pax and Maschke 1935
Choleva glauca Britten, 1918	Skalski 1967
Choleva lederiana gracilenta Szymczakowski, 1957	Kocot-Zalewska and Słupińska 2017, Ochman 2004, Skalski 1971, Skalski 1973a, Skalski 1973b, Skalski 1981, Skalski 1994-1995, Skalski 1994a, Skalski and Wójcik 1968, Szymczakowski 1957
Choleva nivalis Kraatz, 1856 [=*Choleva bicolor* Jeannel, 1923 ‡]	Kowalski 1955, Skalski 1967
Choleva (*Cholevopsis*) *spadicea* (J. Sturm, 1839)	Pax and Maschke 1935
Cryptophagus pilosus Gyllenhal, 1827	Pax and Maschke 1935
Duvaliopsis pilosella stobieckii (Csiki, 1907)	Kowalski 1955, Skalski 1971
Enicmus minutus (Linnaeus, 1767)	Ochman 2004, Skalski 1973a
Lathrobium pallidum Nordmann, 1837	Pax and Maschke 1935
Lesteva monticola Kiesenwetter, 1847	Kowalski 1955
Nebria tatrica Miller, 1859	Kowalski 1955
Ocalea badia W.F. Erichson, 1837	Pax and Maschke 1935
Omalium excavatum Stephens, 1834	Kowalski 1955
Omalium rivulare Paykull, 1789	Kowalski 1955, Pax and Maschke 1935
Omalium septentrionis C.G. Thomson, 1857	Pax and Maschke 1935
Othius myrmecophilus Kiesenwetter, 1843	Ochman 2004, Skalski 1973a
Otiorhynchus scaber (Linnaeus, 1758)	Kowalski 1955
Philonthus (*Philonthus*) *carbonarius* (Gravenhorst, 1802) [= *Philontus varius* (Gyllenhal, 1810) ‡]	Skalski 1973a
Poecilus lepidus lepidus (Leske, 1785) [= *Pterostichus virens* (Müller, 1776) ‡]	Sobiepanek 1985
Pselaphus heisei J.F.W. Herbst, 1792	Pax and Maschke 1935
Pterostichus niger (Schaller, 1783)	Pax and Maschke 1935
Quedius humeralis Stephens, 1832	Kowalski 1955
Quedius maurus (Sahlberg, 1830)	Ochman 2004, Skalski 1973a
Quedius mesomelinus (Marsham, 1802)	Demel 1918, Gubała 1996, Kowalski 1955, Ochman 2004, Pax and Maschke 1935, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968
Quedius ochropterus Erichson, 1840	Kowalski 1955
Speonomus normandi hydrophilus Jeannel, 1907	Dumnicka and Płotek 2013, Klasiński 2006, Kocot-Zalewska 2016, Skalski 1994a, Skalski 1994b
Sphodrus leucophthalmus (Linnaeus, 1758)	Gubała 1996
Tachinus subterraneus (Linnaeus, 1758)	Kowalski 1955
Trechus latus Putzeys, 1847	Kowalski 1955
Trechus quadristriatus (Schrank von Paula, 1781)	Pax and Maschke 1935
Trichophya pilicornis (L. Gyllenhal, 1810)	Pax and Maschke 1935
Xylodromus concinnus (Th. Marsham, 1802)	Pax and Maschke 1935
Diptera:	
Amoebaleria spectabilis (Loew, 1862)	Kowalski 1955
Aphiochaeta rufipes Meigen, 1804	Arndt 1921
Apteromyia claviventris (Strobl, 1909) [=*Limosina claviventris* Strobl, 1909‡]	Pax and Maschke 1935
Bradysia forficulata (Bezzi, 1914) [= *Neosciara forficulata* Bezzi, 1914‡]	Pax and Maschke 1935

Species	References
Bolitophila ofnerea	Sobiepanek 1985
Calliphora vicina Robineau-Desvoidy, 1830 [= *Calliphora erythrocephala* Meigen, 1826 ‡]	Pax and Maschke 1935
Calliphora vomitoria (Linnaeus, 1758)	Pax and Maschke 1935, Skalski 1973a, Skalski 1981
Copromyza glacialis (Meigen, 1830)	Sobiepanek 1985
Copromyza nigra (Meigen, 1830)	Sobiepanek 1985
Copromyza nitida (Meigen, 1830)	Sobiepanek 1985
Crumomyia nitida (Meigen, 1830)	Kowalski 1955
Crumomyia nigra (Meigen, 1830) [= *Borborus nigra* Meigen, 1830‡]	Pax and Maschke 1935
Crumomyia glacialis (Meigen, 1830)	Hajduk and Ogorzałek 1970, Skalski 1967
Culex pipiens Linnaeus, 1758	Arndt 1921, Hajduk and Ogorzałek 1970, Kowalski 1955, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Skalski 1981,
Culiseta annulata (Schrank, 1776)	Hajduk and Ogorzałek 1970, Pax and Maschke 1935, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968
Cypsela nigra Meigen †	Arndt 1921
Cypsela suillina †	Arndt 1921
Diplonevra florescens (Turton, 1801) [=*Diploneura versicolor* Schmitz, 1929‡ = *Diploneura florea* (Fabricius, 1794) ‡]	Pax and Maschke 1935
Drosophila (*Sophophora*) *melanogaster* Meigen, 1830 [= *Drosophila fasciata* ‡]	Skalski 1973a
Eccoptomera emarginata Loew, 1862	Hajduk and Ogorzałek 1970, Kowalski 1955, Pax and Maschke 1935, Sobiepanek 1985
Eccoptomera obscura (Meigen, 1830)	Sobiepanek 1985
Eccoptomera pallescens (Meigen, 1830)	Hajduk and Ogorzałek 1970, Kowalski 1955, Skalski 1967
Exechia indecisa (Walker, 1856) [=*Exechiopsis indecisa* ‡]	Ochman 2004, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968
Gymnomus caesius (Meigen, 1830) [=*Scoliocentra caesis* = *Heleomyza caesia* (Meigen, 1830) = *Amoebaleria caesia* (Meigen, 1830) ‡]	Arndt 1921, Hajduk and Ogorzałek 1970, Kowalski 1955, Pax and Maschke 1935, Sobiepanek 1985
Gymnomus amplicornis (Czerny, 1924) [=*Amoebaleria amplicornis* Czerny, 1924‡]	Skalski 1967
Heleomyza captiosa (Gorodkov, 1962)	Dumnicka and Płotek 2013, Sobiepanek 1985
Heleomyza modesta (Meigen, 1835)	Arndt 1921, Hajduk and Ogorzałek 1970, Kowalski 1955, Pax and Maschke 1935, Sobiepanek 1985, Skalski 1967
Heleomyza serrata (Linnaeus, 1758)	Arndt 1921, Hajduk and Ogorzałek 1970, Kowalski 1955, Ochman 2004, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Sobiepanek 1985,
Heteromyza atricornis Meigen, 1830 [= *Thelida atricornis* ‡]	Kowalski 1955
Hydrophorus bipunctatus (Lehmann, 1822)	Pax and Maschke 1935
Hydrotaea dentipes (Fabricius, 1805)	Pax and Maschke 1935
Limonia nubeculosa Meigen, 1804	Arndt 1921, Hajduk and Ogorzałek 1970
Limonia silvatica (Meigen, 1830) [=*Limosina silvatica* ‡]	Arndt 1921
Megaselia albicaudata (Wood, 1910)	Pax and Maschke 1935
Megaselia angusta (Wood, 1909)	Pax and Maschke 1935
Megaselia pulicaria (Fallen, 1823)	Pax and Maschke 1935
Megaselia rufipes (Meigen, 1804)	Pax and Maschke 1935
Meiosimyza rorida (Fallén, 1820) [= *Sapromyza rorida* Fallén, 1820‡]	Pax and Maschke 1935
Mycetophila ruficollis Meigen, 1818	Sobiepanek 1985
Neuroctena anilis Fallen, 1820 [= *Dryomyza anilis* Fallén, 1820‡]	Pax and Maschke 1935
Oecothea praecox Loew, 1862	Arndt 1921

Species	References
Phaonia populi (Meigen, 1826)	Ochman 2004, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968
Sarcophaga alpina Zetterstedt, 1838 [= *Acrophaga alpina* Zetterstedt, 1838‡]	Pax and Maschke 1935
Sciara atomaria (Lynch Arribalzaga, 1892) [= *Neosciara vivida* Winnertz, 1867‡]	Pax and Maschke 1935
Scoliocentra villosa (Meigen, 1830)	Dumnicka and Płotek 2013, Ochman 2004, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968,
Spelobia pseudosetaria (Duda, 1918) [=*Limosina penetralis* Collin, 1925‡]	Pax and Maschke 1935
Speolepta leptogaster (Winnertz, 1863)	Pax and Maschke 1935, Sobiepanek 1985
Sphaerophoria scripta (Linnaeus, 1758)	Kowalski 1955
Sylvicola fenestralis (Scopoli, 1763) [=*Anisopus fenestralis* (Scopoli 1763) ‡]	Hajduk and Ogorzałek 1970
Theobaldia alascaensis Ludlow †	Kowalski 1955
Tipula scripta Meigen, 1830	Arndt 1921
Trichocera hiemalis (De Geer, 1776)	Pax and Maschke 1935
Trichocera maculipennis Meigen, 1818	Arndt 1923, Demel 1918, Ochman 2004, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Sobiepanek 1985
Trichocera regelationis (Linnaeus, 1758)	Pax and Maschke 1935
Triphleba antricola (Schmitz, 1918)	Pax and Maschke 1935
Triphleba distinguenda (Strobl, 1892) [=*Triphleba unicalcarata* (Becker, 1901) ‡]	Pax and Maschke 1935
Triphleba hyalinata (Meigen, 1830)	Pax and Maschke 1935
Triphleba lyria Schmitz, 1935	Pax and Maschke 1935
Triphleba uncinate Schmitz †	Pax and Maschke 1935
Thoracochaeta brachystoma (Stenhammar, 1855)	Pax and Maschke 1935
Hymenoptera:	
Amblytelus atratorius (Villers, 1789)[=*Coelichneumon atratorius* ‡]	Arndt 1921
Ambyletus quadripunctorius Muller †	Kowalski 1955
Aspilota nervosa (Haliday, 1833)	Pax and Maschke 1935
Blacus instabilis Ruthe, 1861	Pax and Maschke 1935
Diphyus monitorius (Panzer, 1801)	Skalski 1973a
Diphyus fossorius (Linnaeus, 1758)	Skalski 1973a
Exallonyx ater (Gravenhorst, 1807) [=*Serphus filicornis* Kieffer, 1908 ‡]	Pax and Maschke 1935
Exallonyx ligatus Nees, 1834 [=*Serphus ligatus* Nees , 1834‡]	Pax and Maschke 1935
Exephantes hilaris Gravenhorst †	Hajduk and Ogorzałek 1970, Kowalski 1955, Pax and Maschke 1935
Exephanes ischioxanthus (Gravenhorst, 1829)	Skalski 1969, Skalski 1973a, Skalski 1981
Formica fusca Linnaeus, 1758	Pax and Maschke 1935
Hemiteles fulvipes Gravenhorst, 1929 †	Pax and Maschke 1935
Ichneumon extensorius Linnaeus, 1758	Pax and Maschke 1935
Ichneumon gracilicornis Gravenhorst, 1829	Pax and Maschke 1935
Megastylus cruentator Schiødte, 1839	Pax and Maschke 1935
Mutilla europaea Linnaeus, 1758	Hajduk and Ogorzałek 1970
Proctotrypes gravidator (Linnaeus, 1758)	Skalski 1981
Tretoserphus laricis (Haliday, 1839) [=*Cryptoserphus laricis* (Haliday, 1839) ‡]	Pax and Maschke 1935
Lepidoptera:	
Aglais urcticae (Linnaeus, 1758)[=*Vanessa urticae* (Linnaeus, 1758) ‡]	Kowalski 1955, Pax and Maschke 1935, Skalski 1967, Skalski 1973a

Species	References
Bomolocha obesalis Treitschke 1828	Kowalski 1955, Skalski 1967
Caradrina simulans (Hufnagel, 1766) [= *Rhyacia simulans* (Hufnagel, 1766) ‡]	Skalski 1973a
Hypena obsitalis (Hübner, 1813)	Skalski 1969
Hypena rostralis (Linnaeus, 1758)	Skalski 1973a
Monopis laevigella (Denis & Schiffermüller, 1775) [= *Monopis rusticella* (Hübner, 1813) ‡]	Skalski 1973a
Nudaria mundana (Linnaeus, 1760)	Skalski 1973a
Scoliopteryx libatrix (Linnaeus, 1758)	Baranek and Powichrowski 1975, Demel 1918, Dumnicka and Płotek 2013, Hajduk and Ogorzałek 1970, Kowalski 1955, Kur et al. 2016, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Skalski 1981, Skalski 1994-1995, Skalski and Wójcik 1968, Sobiepanek 1985, Wołoszyn and Wójcik 1964
Triphosa dubitata (Linnaeus, 1758)	Arndt 1921, Baranek and Powichrowski 1975, Demel 1918, Dumnicka and Płotek 2013, Hajduk and Ogorzałek 1970, Kowalski 1955, Kur et al. 2016, Pax and Maschke 1935, Pax 1937, Skalski 1967, Skalski 1973a, Skalski 1981, Skalski 1994-1995, Skalski and Wójcik 1968, Sobiepanek 1985, Wołoszyn and Wójcik 1964,
Vanessa io (Linnaeus, 1758)	Arndt 1921, Dumnicka and Płotek 2013, Kowalski 1955, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Wołoszyn and Wójcik 1964,
Trichoptera:	
Micropterna nycterobia McLachlan, 1875	Arndt 1921, Hajduk and Ogorzałek 1970
Micropterna sequax McLachlan, 1875	Arndt 1921
Micropterna testacea (Gmelin, 1789)	Arndt 1921, Hajduk and Ogorzałek 1970
Stenophylax permistus McLachlan, 1895	Arndt 1921, Baranek and Powichrowski 1975, Demel 1918, Hajduk and Ogorzałek 1970, Kowalski 1955, Ochman 2004, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Sobiepanek 1985,
Siphonaptera:	
Ctenophthalmus solutus Jordan & Rothschild, 1920	Skalski 1981
Ischnopsyllus hexactenus (Kolenati, 1856)	Pax and Maschke 1935
Nosopsyllus fasciatus (Bosc, 1800)	Skalski 1981
Thysanoptera	
Chirothrips manicatus Haliday, 1836	Pax and Maschke 1935

† – status of the species name is unclear , ‡ - name published in original paper

Arachnids are the most often represented group of terrestrial invertebrate with 317 recorded species. Among the arachnids the mites (Acari) are represented by 189 species, spiders (Araneae) by 103 species. Remaining orders of Arachnids (Opiliones and Pseudoscorpionida) are represented by 20 and 5 species respectively. Detailed list of arachnids recorded in Polish caves is presented in Table 2.

Table 2. The checklist of arachnids recorded in Polish caves.

Species	References
Acari	
Adoristes ovatus (Koch, 1839)	Maślak and Barczyk 2011
Ameroseius furcatus Karg, 1971	Barczyk and Madej 2014
Ameroseius plumea Oudemans, 1930	Barczyk and Madej 2014
Ameroseius plumigerus Oudemans, 1930	Barczyk and Madej 2014

Species	References
Anachipteria deficiens Grandjean, 1932	Maślak and Barczyk 2011
Antennoseius bacatus Athias-Henriot, 1961	Barczyk and Madej 2014
Arctoseius brevichelis Karg, 1969	Barczyk and Madej 2014
Arctoseius cetratus (Sellnick, 1940)	Barczyk and Madej 2014
Arctoseius magnanalis Evans, 1958	Barczyk and Madej 2014
Arctoseius venustulus (Berlese, 1917)	Barczyk and Madej 2014
Asca aphidioides (Linneaus, 1758)	Barczyk and Madej 2014
Atropacarus striculus (Koch, 1835)	Maślak and Barczyk 2011
Autogneta longilamellata (Michael, 1885)	Maślak and Barczyk 2011
Berniniella bicarinata (Paoli, 1908)	Maślak and Barczyk 2011
Carabodes femoralis (Nicolet, 1855)	Maślak and Barczyk 2011
Carabodes ornatus Štorkán, 1925	Maślak and Barczyk 2011
Cepheus dentatus (Michael, 1888)	Maślak and Barczyk 2011
Ceratozetes gracilis gracilis (Michael, 1884)	Maślak and Barczyk 2011
Ceratozetes mediocris Berlese, 1908	Maślak and Barczyk 2011
Chamobates (*Xiphobates*) *voigtsi* (Oudemans, 1902)	Maślak and Barczyk 2011
Chamobates cuspidatus (Michael, 1884)	Maślak and Barczyk 2011, Pax and Maschke 1935
Chamobates pusillus (Berlese, 1895)	Maślak and Barczyk 2011
Chamobates subglobulus (Oudemans, 1900)	Maślak and Barczyk 2011
Coproglyphus stammeri (Türk & Türk, 1957)	Skalski 1994a
Cultroribula bicultrata (Berlese, 1905)	Maślak and Barczyk 2011
Cyrtolaelaps chiropterae Karg, 1971	Barczyk and Madej 2014
Cyrtolaelaps mucronatus (G. & R. Canestrini, 1881)	Barczyk and Madej 2014
Cyta latirostris (Hermann, 1804)	Pax and Maschke 1935
Damaeus gracilipes (Kulczyński, 1902) [= *Belba gracilipes* Kulczyński‡]	Pax and Maschke 1935
Dendrolaelaps (*Punctodendrolaelaps*) *arvicolus* (Leitner, 1949)	Barczyk and Madej 2014
Dendrolaelaps (*Punctodendrolaelaps*) *rotundus* (Hirschm, 1960)	Barczyk and Madej 2014
Dissorhina ornata (Oudemans, 1900)	Maślak and Barczyk 2011, Skalski 1973a
Eugamasus cavernicola Trägårdh, 1912	Barczyk and Madej 2014
Eugamasus furcatus (G. et R.Canestrini, 1882)	Barczyk and Madej 2014
Eupelops acromios (Hermann, 1804)	Maślak and Barczyk 2011
Eupelops plicatus (Koch, 1835)	Maślak and Barczyk 2011
Euphthiracarus cribrarius (Berlese, 1904)	Maślak and Barczyk 2011
Euryparasitus emarginatus (Koch, 1839)	Barczyk and Madej 2014
Eviphis ostrinus (Koch, 1836)	Barczyk and Madej 2014
Fosseremus laciniatus (Berlese, 1905)	Maślak and Barczyk 2011
Foveacheles (*Proxistella*) *terricola* (Koch, 1835) [=*Rhagidia terricola* Koch, 1935 ‡]	Pax and Maschke 1935, Pax 1937
Gaeolaelaps aculeifer (Canestrini, 1883)	Barczyk and Madej 2014
Gaeolaelaps brevipilis (Bernhard, 1969)	Barczyk and Madej 2014
Gaeolaelaps nolli (Karg, 1962)	Barczyk and Madej 2014
Gamasellodes bicolor (Berlese, 1918)	Barczyk and Madej 2014
Gamasellus montanus (Willmann, 1936)	Barczyk and Madej 2014
Gamasellus spiricornis (G. & R. Canestrini, 1882)	Barczyk and Madej 2014
Gamasodes spiniger (Trägårdh, 1910)	Barczyk and Madej 2014
Geholaspis (*Geholaspis*) *longispinosus* (Kramer, 1876)	Barczyk and Madej 2014
Geholaspis (*Longicheles*) *mandibularis* (Berlese, 1904)	Barczyk and Madej 2014
Globozetes birulai (Kulczynski, 1902)	Maślak and Barczyk 2011
Haemogamasus nidi Michael, 1892	Barczyk and Madej 2014
Hemileius initialis (Berlese, 1908)	Maślak and Barczyk 2011
Holoparasitus calcaratus (Koch, 1839)	Barczyk and Madej 2014

Species	References
Holoparasitus excisus (Berlese, 1906)	Barczyk and Madej 2014
Holoparasitus intermedius (Holzmann, 1969)	Barczyk and Madej 2014
Hypoaspis (*Alloparasitus*) *oblonga* (Halbert, 1915)	Barczyk and Madej 2014
Hypoaspis (*Alloparasitus*) *sardoa* (Berlese, 1911)	Barczyk and Madej 2014
Hypochthonius luteus Oudemans, 1917	Maślak and Barczyk 2011
Ixodes ricinus Linnaeus, 1758	Skalski 1973a, Skalski 1981
Ixodes vespertilionis Koch, 1844	Skalski 1973a, Skalski 1981
Kunstidamaeus tecticola (Michael, 1888)	Maślak and Barczyk 2011
Lasioseius lawrencei Evans, 1957	Barczyk and Madej 2014
Lasioseius muricatus (Koch, 1839)	Barczyk and Madej 2014
Lauroppia beskidyensis (Niemi et Skubala, 1993)	Maślak and Barczyk 2011
Lauroppia falcata marginedentata (Strenzke, 1951)	Maślak and Barczyk 2011
Lauroppia maritima (Willmann, 1928)	Maślak and Barczyk 2011
Leptogamasus alstoni (Bhattacharyya, 1963)	Barczyk and Madej 2014
Leptogamasus parvulus (Berlese, 1903)	Barczyk and Madej 2014
Leptogamasus tectegynellus (Athias-Henriot, 1967)	Barczyk and Madej 2014
Licneremaeus licnophorus (Michael, 1882)	Maślak and Barczyk 2011
Liebstadia longior (Berlese, 1908)	Maślak and Barczyk 2011
Liochthonius hystricinus (Forsslund, 1942)	Maślak and Barczyk 2011
Macrocheles (*Macrholaspis*) *dentatus* (Evans & Browning, 1956)	Barczyk and Madej 2014
Macrocheles (*Macrholaspis*) *recki* (Bregetova & Koroleva, 1960)	Barczyk and Madej 2014
Macrocheles (*Macrocheles*) *tardus* (Koch, 1841)	Barczyk and Madej 2014
Macrocheles carinatus (Koch, 1839)	Barczyk and Madej 2014
Macrocheles montanus (Willmann, 1951)	Barczyk and Madej 2014
Macronyssus ellipticus (Kolenati, 1856) [= *Liponissus ellipticus* Kolenati,1856‡]	Pax and Maschke 1935
Metabelba (*Parametabelba*) *italica* (Sellnick, 1931)	Maślak and Barczyk 2011
Metabelba pulverulenta (Koch, 1839)	Maślak and Barczyk 2011
Minunthozetes pseudofusiger (Schweizer, 1922)	Maślak and Barczyk 2011
Moritzoppia keilbachi (Moritz, 1969)	Maślak and Barczyk 2011
Moritzoppia unicarinata (Paoli, 1908)	Maślak and Barczyk 2011
Multioppia glabra (Mihelčič, 1955)	Maślak and Barczyk 2011
Nicoletiella denticulata (Schrank, 1776)	Pax and Maschke 1935, Pax 1937
Ololaelaps placentula (Berlese, 1887)	Barczyk and Madej 2014
Olopachys suecicus Sellnick, 1950	Barczyk and Madej 2014
Oppiella nova (Oudemans, 1902)	Maślak and Barczyk 2011
Oribatella calcarata (Koch, 1835)	Maślak and Barczyk 2011
Oribatella meridionalis (Berlese, 1908)	Pax and Maschke 1935, Pax 1937
Oribellopsis cavaticus (Kunst, 1962)	Maślak and Barczyk 2011
Pachydellus furcifer (Oudemans, 1903)	Barczyk and Madej 2014
Pachydellus ineptus (Hirschmann & Krauss, 1965)	Barczyk and Madej 2014
Pachydellus sculptus Berlese, 1920	Barczyk and Madej 2014
Pachyglobolaelaps hallidayi Masán, 2014	Barczyk and Madej 2014
Pachylaelaps (*Longipachylaelaps*) cf. *longisetis* Halbert, 1915	Barczyk and Madej 2014
Pachylaelaps (*Longipachylaelaps*) *sublongisetis* Koroleva, 1977	Barczyk and Madej 2014
Pachylaelaps (*Pachylaelaps*) *imitans* Berlese, 1920	Barczyk and Madej 2014
Pachylaelaps (*Pachylaelaps*) *littoralis* Halbert, 1915	Barczyk and Madej 2014
Pachylaelaps (*Pachylaelaps*) *pectinifer* (G. & R. Canestrini, 1881)	Barczyk and Madej 2014
Pachylaelaps (*Pachylaelaps*) *troglophilus* Willmann, 1940	Barczyk and Madej 2014
Pachyseius humeralis Berlese, 1910	Barczyk and Madej 2014

Species	References
Pantelozetes cavaticus (Kunst, 1962) [=*Oribella cavatica* Kunst, 1962‡]	Skalski 1994a
Pantelozetes paolii (Oudemans, 1913)	Maślak and Barczyk 2011
Paragamasus (*Aclerogamasus*) *alpestris* (Berlese, 1904)	Barczyk and Madej 2014
Paragamasus (*Aclerogamasus*) *similis* (Willmann, 1953)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *arcuatus*	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *brevicornis*	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *brevipes* (Berlese, 1905)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *digitulus* (Karg, 1963)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *homopodoides* (Athias-Henriot, 1967)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *lapponicus* (Trägardh, 1910)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *mediocris* Berlese, 1904	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *misellus* (Berlese, 1903)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *runcatellus* (Berlese, 1903)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *runciger* (Berlese, 1904)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *truncus* Schweizer, 1961	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *vagabundus* (Karg, 1968)	Barczyk and Madej 2014
Paragamasus (*Anidogamasus*) *wasmanni* (Oudemans, 1902)	Barczyk and Madej 2014
Parasitus loricatus (Wankel, 1861) [=*Parasitus niveus*‡ = *Eugamasus loricatus* Wankel, 1861‡]	Barczyk and Madej 2014, Pax and Maschke 1935, Skalski 1967, Skalski 1973a, Skalski 1981
Parasitus hortivagus (Berlese, 1903)	Barczyk and Madej 2014
Parasitus kraepelini Berlese, 1903 [=*Eugamasus kraepelini* Berlese, 1903‡]	Pax and Maschke 1935
Parasitus maschkeae Willmann, 1936	Skalski 1967
Parazercon radiatus (Berlese, 1910)	Barczyk and Madej 2014
Pergamasus (*Thenargamasus*) *barbarus* (Berlese, 1904)	Barczyk and Madej 2014
Pergamasus (*Pergamasus*) *brevicornis* Berlese, 1903	Barczyk and Madej 2014
Pergamasus (*Pergamasus*) *crassipes* Berlese, 1906	Barczyk and Madej 2014
Pergamasus (*Pergamasus*) *mediocris* Berlese, 1904	Barczyk and Madej 2014
Pergamasus robustus (Oudemans, 1902)	Skalski 1967
Phaulodiaspis advena (Tragardh, 1992)	Dylewska and Błoszyk 2006, Skalski 1981
Phthiracarus (*Archiphthiracarus*) *bryobius* Jacot, 1930	Maślak and Barczyk 2011
Pilogalumna crassiclava (Berlese, 1914)	Maślak and Barczyk 2011
Pilogalumna tenuiclava (Berlese, 1908)	Maślak and Barczyk 2011
Poecilochirus carabi G. & R. Canestrini, 1882	Barczyk and Madej 2014
Porrhostaspis lunulata Muller, 1859	Barczyk and Madej 2014
Proctolaelaps pygmaeus (Muller, 1860)	Barczyk and Madej 2014
Prozercon fimbriatus (Koch, 1839)	Barczyk and Madej 2014
Prozercon kochi Sellnick, 1943	Barczyk and Madej 2014
Prozercon sellnicki Halaskova, 1963	Barczyk and Madej 2014
Prozercon traegardhi (Halbert, 1923)	Barczyk and Madej 2014
Punctoribates punctum (Koch, 1839)	Maślak and Barczyk 2011
Pygmeophorus spinosus Kramer, 1877	Pax and Maschke 1935, Skalski 1981
Quadroppia quadricarinata (Michael, 1885)	Maślak and Barczyk 2011
Ramusella (*Insculptoppia*) *furcata* (Willmann, 1928)	Maślak and Barczyk 2011
Rhagidia reflexa var. volmsdorfensis †	Pax and Maschke 1935, Pax 1937
Rhinoppia hygrophila (Mahunka, 1987)	Maślak and Barczyk 2011
Rhinoppia nasuta (Moritz, 1965)	Maślak and Barczyk 2011
Rhinoppia obsoleta (Paoli, 1908)	Maślak and Barczyk 2011
Rhinoppia subpectinata (Oudemans, 1900)	Maślak and Barczyk 2011
Rhodacarellus apophyseus Karg, 1971	Barczyk and Madej 2014
Rhodacarellus silesiacus Willmann, 1935	Barczyk and Madej 2014
Rhodacarus calcurulatus Berlese, 1921	Barczyk and Madej 2014

Species	References
Rhodacarus coronatus Berlese, 1921	Barczyk and Madej 2014
Rhodacarus mandibularis Berlese, 1921	Barczyk and Madej 2014
Scheloribates laevigatus (Koch, 1835)	Maślak and Barczyk 2011
Sphaerozetes piriformis (Nicolet, 1855)	Maślak and Barczyk 2011
Spinturnix murinus Walckenaer †	Pax and Maschke 1935
Subiasella (*Lalmoppia*) *quadrimaculata* (Evans, 1952)	Maślak and Barczyk 2011
Suctobelba altvateri Moritz, 1970	Maślak and Barczyk 2011
Suctobelba lapidaria Moritz, 1970	Maślak and Barczyk 2011
Suctobelba trigona (Michael, 1888)	Maślak and Barczyk 2011
Suctobelbella (*Flagrosuctobelba*) *alloenasuta* Moritz, 1971	Maślak and Barczyk 2011
Suctobelbella similis (Forsslund, 1941)	Maślak and Barczyk 2011
Tectocepheus alatus Berlese, 1913	Maślak and Barczyk 2011
Tectocepheus velatus (Michael, 1880)	Maślak and Barczyk 2011
Unduloribates undulates (Berlese, 1914)	Maślak and Barczyk 2011
Veigaia cerva (Kramer, 1876)	Barczyk and Madej 2014
Veigaia exigua (Berlese, 1916)	Barczyk and Madej 2014
Veigaia kochi (Trägårdh, 1901)	Barczyk and Madej 2014
Veigaia nemorensis (Koch, 1839)	Barczyk and Madej 2014
Veigaia planicola (Berlese, 1892)	Barczyk and Madej 2014
Veigaia transisalae (Oudemans, 1902)	Barczyk and Madej 2014
Vulgarogamasus kraepelini (Berlese, 1905)	Barczyk and Madej 2014
Vulgarogamasus maschkeae Willmann, 1936	Barczyk and Madej 2014
Vulgarogamasus remberti (Oudemans, 1912)	Barczyk and Madej 2014
Vulgarogamsus oudemansi (Berlese, 1904)	Barczyk and Madej 2014
Zercon arcuatus Trägårdh, 1931	Barczyk and Madej 2014
Zercon baloghi Sellnick, 1958	Barczyk and Madej 2014
Zercon berlesei Sellnick, 1958	Barczyk and Madej 2014
Zercon curiosus Trägårdh, 1910	Barczyk and Madej 2014
Zercon fageticola Halaskova, 1969	Barczyk and Madej 2014
Zercon peltatus Koch, 1836	Barczyk and Madej 2014
Zercon romagniolus Sellnick, 1944	Barczyk and Madej 2014
Zercon storkani Halaskova, 1969	Barczyk and Madej 2014
Zercon triangularis Koch, 1836	Barczyk and Madej 2014
Zercon vacuus Koch, 1839	Barczyk and Madej 2014
Zerconopsis remiger (Kramer, 1876)	Barczyk and Madej 2014
Zetorchestes micronychus micronychus (Berlese, 1883)	Maślak and Barczyk 2011
Araneae:	
Agroeca brunnea (Blackwall, 1833)	Sanocka-Wołoszynowa 1981
Agyneta rurestris (C. L. Koch, 1836) [=*Meioneta rurestris* C. L. Koch, 1836 ‡]	Sanocka-Wołoszyn 1963
Agyneta subtilis (Pickard-Cambridge, 1863)	Sanocka-Wołoszynowa 1981
Amaurobius fenestralis (Ström, 1768)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Anguliphantes angulipalpis (Westring, 1851) [=*Lepthyphantes angulipalpis* ‡]	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Anguliphantes monticola (Kulczynski, 1882) [=*Lepthyphantes monticola* ‡]	Czajka and Hajduk 1978, Ochman 2004, Rozwałka et al. 2010, Sanocka-Wołoszynowa 1981, Skalski 1973a, Skalski 1981, Skalski 1994-1995, Skalski 1994a
Anyphaena accentuata (Walckenaer, 1802)	Sanocka-Wołoszyn 1963
Araneus diadematus Clerck, 1757	Ochman 2004, Sanocka-Wołoszyn 1963, Skalski 1973a
Bathyphantes nigrinus (Westring, 1851)	Sanocka-Wołoszynowa 1981
Callobius claustrarius (Hahn, 1833) [= *Amaurobius claustrarium* Hahn‡]	Sanocka-Wołoszyn 1963

Species	References
Centromerita bicolor (Blackwall, 1833)	Sanocka-Wołoszynowa 1981
Centromerus cavernarum (Koch, 1872) [=*Centromerus jacksoni* Denis, 1952 =*Taranucnus cavernarum* Simon, 1884‡]	Ochman 2004, Pax 1937, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1981
Centromerus sellarius (Simon, 1884)	Sanocka-Wołoszynowa 1981
Centromerus sylvaticus (Blackwall, 1841)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Wołoszyn and Wójcik 1964,
Cicurina cicur (Fabricius, 1793) [=*Cicurina cicurea* ‡]	Arndt 1921, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Clubiona brevipes Blackwall, 1841 [=*Microclubiona brevipes* ‡]	Sanocka-Wołoszynowa 1981
Clubiona frutetorum L. Koch, 1867	Pax and Maschke 1935
Coelotes terrestris (Wider, 1834)	Ochman 2004, Skalski 1973a
Cryphoeca silvicola (Koch, 1834)	Sanocka-Wołoszynowa 1981, Sobiepanek 1985
Cybaeus angustiarum Koch, 1868	Pax and Maschke 1935, Sobiepanek 1985
Dicymbium nigrum brevisetosum (Blackwall, 1834)	Sanocka-Wołoszynowa 1981
Diplocephalus cristatus (Blackwall, 1833)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Diplocephalus picinus (Blackwall, 1841)	Sanocka-Wołoszynowa 1981
Diplostyla concolor (Wider, 1834)	Sanocka-Wołoszynowa 1981
Drassodes lapidosus (Walcknaer, 1802)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Drassodes pubescens (Thorell, 1856)	Sanocka-Wołoszynowa 1981
Eratigena atrica (Koch, 1843) [= *Tegenaria atrica* ‡]	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Erigone atra Blackwall, 1833	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Erigone dentipalpis (Wider, 1834)	Sanocka-Wołoszynowa 1981
Formiphantes lephthyphantiformis (Strand, 1907) [=*Lepthyphantes pisai* ‡]	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Gnaphosa bicolor (Hahn, 1833)	Sanocka-Wołoszynowa 1981
Gonatium rubens (Blackwall, 1833)	Sanocka-Wołoszynowa 1981
Gongylidium rufipes (Linnaeus, 1758)	Sanocka-Wołoszynowa 1981
Hahnia pusilla Koch, 1841	Ochman 2004, Sanocka-Wołoszynowa 1981
Harpactea hombergi (Scopoli, 1763)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Harpactea rubicunda (Koch, 1838)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Helophora insignis (Blackwall, 1841)	Sanocka-Wołoszynowa 1981
Histopona torpida (Koch, 1837)	Sanocka-Wołoszynowa 1981
Hypomma bituberculatum (Wider, 1834)	Sanocka-Wołoszynowa 1981
Inermocoelotes inermis (Koch, 1855)	Sanocka-Wołoszynowa 1981
Kaestneria dorsalis (Wider, 1834)	Sanocka-Wołoszynowa 1981
Labulla thoracica (Wider, 1834)	Czajka and Hajduk 1978, Hajduk and Ogorzałek 1970, Sanocka-Wołoszynowa 1981
Lepthyphantes leprosus (Ohlert, 1865)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a, Wołoszyn and Wójcik 1964,
Lepthyphantes minutus (Blackwall, 1833)	Sanocka-Wołoszynowa 1981
Lepthyphantes nodifer Simon, 1884	Ochman 2004, Sanocka-Wołoszynowa 1981
Leptorhoptrum robustum (Westring, 1851)	Sanocka-Wołoszynowa 1981
Liocranum rupicola (Walckenaer, 1830)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Linyphia triangularis (Clerck, 1757)	Sanocka-Wołoszyn 1963
Macrargus rufus (Wider, 1834)	Sanocka-Wołoszynowa 1981
Mansuphantes arciger (Kulczyński, 1882) [=*Lepthyphantes arciger* ‡]	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Mansuphantes mansuetus (Thorell, 1875) [= *Lepthyphantes mansuetus* ‡]	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Maso sundevalli (Westring, 1851)	Czajka and Hajduk 1978, Sanocka-Wołoszynowa 1981

Species	References
Megalepthyphantes nebulosus (Sundevall, 1830) [=*Lepthyphantes nebulosus* ‡]	Arndt 1921, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a, Wołoszyn and Wójcik 1964
Meta menardi (Latreille, 1804)	Błoszyk and Rozwałka 2008, Czajka and Hajduk 1978, Demel 1918, Dumnicka and Płotek 2013, Gubała 1996, Hajduk and Ogorzałek 1970, Kowalski 1955, Kur et al. 2016, Ochman 2004, Pax and Maschke 1935, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1967, Skalski 1973a, Skalski 1981, Skalski 1994-1995, Sobiepanek 1985, Wołoszyn and Wójcik 1964
Metellina merianae (Scopoli, 1763)	Arndt 1921, Czajka and Hajduk 1978, Demel 1918, Sanocka-Wołoszyn 1963, Skalski 1981, Wołoszyn and Wójcik 1964
Metellina segmentata (Clerck, 1757) [=*Meta reticulate* ‡]	Arndt 1921
Micrargus herbigradus (Blackwall, 1854)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981,
Microneta viaria (Blackwall, 1841)	Sanocka-Wołoszynowa 1981
Nesticus cellulanus (Clerck, 1757)	Błoszyk and Rozwałka 2008, Dumnicka and Płotek 2013, Ochman 2004, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a, Wołoszyn and Wójcik 1964
Obscuriphantes obscurus (Blackwall, 1841) [= *Lepthyphantes obscurus* ‡]	Sobiepanek 1985
Oedothorax agrestis (Blackwall, 1853)	Sanocka-Wołoszynowa 1981
Oedothorax apicatus (Blackwall, 1850)	Sanocka-Wołoszynowa 1981
Oedothorax gibbosus (Blackwall, 1841)	Sanocka-Wołoszynowa 1981
Palliduphantes pallidus (O. Pickard-Cambridge, 1871) [= *Lepthyphantes pallidus* ‡]	Ochman 2004, Sanocka-Wołoszynowa 1981
Pardosa agrestis (Westring, 1861)	Sanocka-Wołoszyn 1963
Pardosa monticola (Clerck, 1757)	Sanocka-Wołoszynowa 1981
Pardosa nigra (Koch, 1834)	Sobiepanek 1985
Pelecopsis parallela (Wider, 1834)	Sanocka-Wołoszynowa 1981
Pholcus opilionoides (Schrank, 1781)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Wołoszyn and Wójcik 1964
Phrurolithus festivus (Koch, 1835)	Sanocka-Wołoszynowa 1981
Pocadicnemis pumila (Blackwall, 1841)	Sanocka-Wołoszynowa 1981
Poeciloneta variegata (Blackwall, 1841) [= *Poeciloneta globose* ‡]	Sanocka-Wołoszynowa 1981
Porrhomma convexum (Westring, 1851)	Błoszyk and Rozwałka 2008, Czajka and Hajduk 1978, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981 Wołoszyn and Wójcik 1964
Porrhomma egeria Simon, 1884 [= *Porrhomma moravicum* Miller & Kratochvíl, 1940 ‡]	Błoszyk and Rozwałka 2008, Demel 1918, Ochman 2004, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1971, Skalski 1973a, Skalski 1981, Skalski 1994-1995, Skalski and Wójcik 1968, Wołoszyn and Wójcik 1964
Porrhomma pallidum Jackson, 1913	Ochman 2004, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a, Wołoszyn and Wójcik 1964
Porrhomma pygmaeum (Blackwall, 1834)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Porrhomma rosenhaueri (L. Koch, 1872)	Pax and Maschke 1935, Pax 1937
Robertus lividus (Blackwall, 1836)	Sanocka-Wołoszynowa 1981
Scotargus pilosus Simon, 1913 [= *Macrargus strandi* (Schenkel, 1934) ‡]	Sanocka-Wołoszynowa 1981
Scotophaeus blackwalli (Thorell, 1856)	Sanocka-Wołoszynowa 1981

Species	References
Segestria senoculata (Linnaeus, 1758)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Sosticus loricatus (L. Koch, 1866) [=*Scotophaeus loricatus* L. Koch, 1866 ‡]	Sanocka-Wołoszyn 1963
Steatoda bipunctata (Linnaeus, 1758)	Sanocka-Wołoszynowa 1981
Stemonyphantes lineatus (Linnaeus, 1758)	Sanocka-Wołoszyn 1963
Syedra gracilis (Menge, 1869)	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Tegenaria domestica (Clarck, 1757)	Arndt 1921, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a,
Tegenaria ferruginea (Panzer, 1804)	Ochman 2004, Pax and Maschke 1935, Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Skalski 1973a
Tegenaria silvestris Koch 1872	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Tenuiphantes alacris (Blackwall, 1853) [= *Lepthyphantes alacris* ‡]	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Tenuiphantes cristatus (Menge, 1866) [= *Lepthyphantes cristatus* ‡]	Sanocka-Wołoszynowa 1981
Tenuiphantes flavipes (Blackwall, 1854) [= *Lepthyphantes flavipes* ‡]	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981, Wołoszyn and Wójcik 1964
Tenuiphantes mengei (Kulczyński, 1887) [= *Lepthyphantes mengei* ‡]	Sanocka-Wołoszynowa 1981, Sobiepanek 1985
Tenuiphantes tenebricola (Wider, 1834) [= *Lepthyphantes tenebricola* ‡]	Sanocka-Wołoszyn 1963, Sanocka-Wołoszynowa 1981
Tenuiphantes tenuis (Blackwall, 1852) [= *Lepthyphantes tenuis* ‡]	Sanocka-Wołoszynowa 1981
Teranucnus cavernarum L. Koch †	Pax and Maschke 1935
Tetragnatha pinicola L. Koch, 1870	Sanocka-Wołoszyn 1963
Textrix denticulata (Olivier, 1789)	Sanocka-Wołoszynowa 1981
Theridion impressum Koch, 1881	Skalski 1973a
Thyreosthenius parasiticus (Westring, 1851)	Sanocka-Wołoszynowa 1981
Trochosa ruricola (De Geer, 1778)	Sanocka-Wołoszynowa 1981
Zodarion germanicum (C. L. Koch, 1837)	Sanocka-Wołoszyn 1963
Zora spinimana (Sundevall, 1833)	Sanocka-Wołoszynowa 1981
Zygiella montana (Koch, 1834)	Sobiepanek 1985
Opiliones:	
Gyas annulatus (Olivier, 1791)	Sobiepanek 1985
Ischyropsalis hellwigi (Panzer, 1794)	Błoszyk and Rozwałka 2008, Kocot-Zalewska and Rozwałka 2018, Sanocka-Wołoszynowa 1981
Ischyropsalis manicata Koch, 1869 [= *Ischyropsalis milleri* = *Ischyropsalis dacica* Roewer, 1916‡]	Kowalski 1955, Skalski 1967, Sobiepanek 1985
Lacinius ephippiatus (Koch, 1835)	Sanocka-Wołoszynowa 1981
Leiobunum blackwalli Meade, 1861	Arndt 1921, Sanocka-Wołoszynowa 1981
Leiobunum rotundum (Latreille, 1798)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Leiobunum rupestre (Herbst, 1799)	Arndt 1921, Kowalski 1955, Ochman 2004, Sanocka-Wołoszynowa 1981, Skalski 1967, Skalski 1973a, Sobiepanek 1985
Mitopus morio (Fabricius, 1779)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981, Sobiepanek 1985
Mitostoma chrysomelas (Hermann, 1804)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Nemastoma lugubre (Müller, 1776)	Sanocka-Wołoszynowa 1981
Oligolophus tridens (Koch, 1836)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Opilio parietinus (De Geer, 1778)	Błoszyk and Rozwałka 2008, Pax and Maschke 1935, Sanocka-Wołoszynowa 1981
Opilio saxatilis Koch, 1839	Sanocka-Wołoszynowa 1981
Paranemastoma kochi (Nowicki, 1870)	Sobiepanek 1985

Species	References
Paranemastoma quadripunctatum (Perty, 1833)	Ochman 2004, Sanocka-Wołoszynowa 1981, Skalski 1994-1995, Skalski 1994a,
Phalangium opilio Linneaus, 1758	Błoszyk and Rozwałka 2008, Pax and Maschke 1935, Sanocka-Wołoszynowa 1981
Platybunus bucephalus (Koch, 1835)	Sobiepanek 1985
Rilaena triangularis (Herbst, 1799)	Sanocka-Wołoszynowa 1981
Siro carpaticus Rafalski, 1956	Skalski 1971
Trogulus tricarinatus (Linneaus, 1758)	Sanocka-Wołoszynowa 1981
Pseudoscorpionida:	
Chelifer cancroides (Linnaeus, 1758)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Chthonius (*Ephippiochthonius*) *tetrachelatus* (Preyssler, 1790)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Neobisium (*Neobisium*) *carcinoides* (Hermann, 1804) [= *Neobisium muscorum* ‡]	Błoszyk and Rozwałka 2008, Kowalski 1955, Sanocka-Wołoszynowa 1981
Neobisium (*Neobisium*) *erythrodactylum* (Koch, 1873)	Błoszyk and Rozwałka 2008, Sanocka-Wołoszynowa 1981
Neobisium (*Neobisium*) *sylvaticum* (Koch, 1835)	Kowalski 1955, Sanocka-Wołoszynowa 1981

† – status of the species name is unclear, ‡ – name published in original paper

The remaining Arthropoda groups are represented as follows: Collembola 79 species, Diplura 1 species, Chilopoda 1 species, Diplopoda 8 species, Symphyla 1 species, Isopoda 9 species. Among other invertebrates recorded in Polish caves 11 species are represented by Oligochaeta and 20 species by Mollusca. Detailed list of species is presented in Table 3.

Table 3. The checklist of other Arthopoda and invertebrates recorded in Polish caves.

Species	References
Collembola	
Anurida granaria (Nicolet, 1847)	Pomorski 1992
Archaphorura serratotuberculata (Stach, 1933) [=*Onychiurus serratotuberculata* Stach, 1933‡]	Stach 1954
Arrhopalites bifidus Stach, 1945	Pomorski 1992, Skalski 1971
Arrhopalites principalis Stach, 1945	Pomorski 1992, Stach 1956
Arrhopalites pygmaeus (Wankel, 1860)	Demel 1918, Kowalski 1955, Pax and Maschke 1935, Ochman 2004, Skalski 1971, Skalski 1973a, Skalski 1973b, Skalski 1981, Skalski and Wójcik 1968, Stach 1919, Stach 1939, Wołoszyn and Wójcik 1964 Stach 1956
Arrhopalites sericus Gisin, 1947	Ochman 2004, Pomorski 1996
Bonetogastrura cavicola (Börner, 1901) [=*Hypogastrura cavicola* ‡]	Ochman 2004, Pomorski 1992, Skalski 1971, Skalski 1973a, Skalski 1973b, Skalski 1981
Ceratophysella armata (Nicolet, 1841)	Kowalski 1955, Pomorski 1996, Skalski 1967
Ceratophysella bengtssoni (Agren, 1904)	Stach 1949
Ceratophysella granulata Stach, 1949	Kowalski 1955, Stach 1949
Ceratophysella michalinae Skarżyński, 2005	Skarżyński 2005
Cryptopygus bipunctatus (Axelson, 1903)	Pomorski 1992
Desoria fennica (Reuter, 1895) [=*Isotoma fennica* ‡]	Kowalski 1955, Stach 1947
Desoria hiemalis (Schoett, 1893) [=*Isotoma hiemalis* Schött, 1893 ‡]	Kowalski 1955

Species	References
Desoria olivacea (Tullberg, 1871) [=*Isotoma olivacea* ‡]	Kowalski 1955, Stach 1939, Stach 1947
Desoria violacea (Tullberg, 1876) [=*Isotoma violacea* ‡]	Kowalski 1955, Stach 1947
Deuterophorura cebennaria (Gisin, 1956)	Kur et al. 2016
Dicyrtomina ornata (Nicolet, 1842)	Ochman 2004
Entomobrya multifasciata (Tullberg, 1871)	Stach 1963
Folsomia fimetaria (Linnaeus, 1758)	Pomorski 1992, Stach 1939
Folsomia lawrencei Rusek, 1984	Ochman 2004, Pomorski 1992, Pomorski 1996
Folsomia candida Willem, 1902 [= *Folsomia litsteri* Bagnall, 1939 ‡]	Kur et al. 2016, Ochman 2004, Pomorski 1992, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Stach 1947
Folsomia quadrioculata (Tullberg, 1871)	Kowalski 1955, Ochman 2004, Pomorski 1992, Pomorski 1996, Skalski 1973a, Skalski and Wójcik 1968, Stach 1939, Stach 1947
Heteromurus nitidus (Templeton, 1835)	Arndt 1921, Demel 1918, Kur et al. 2016, Pax and Maschke 1935, Pomorski 1992, Skalski 1981, Stach 1919, Wołoszyn and Wójcik 1964
Hymenaphorura creatricis Pomorski, 1990	Pomorski 1992
Hymenaphorura nova Pomorski, 1990	Pomorski 1992
Hymenaphorura polonica Pomorski, 1990	Pomorski 1992
Hypogastrura armata (Nicolet, 1842)	Arndt 1921, Ochman 2004
Hypogastrura purpurascens (Lubbock, 1868)	Ochman 2004, Pax and Maschke 1935, Pomorski 1992, Pomorski 1996
Isotoma notabilis Schäffer, 1896	Kowalski 1955, Pomorski 1992, Pomorski 1996, Skalski 1973a, Skalski 1981, Ochman 2004, Stach 1939, Stach 1947
Isotoma propinqua Axelson, 1902	Skalski 1973a, Ochman 2004
Isotomiella minor (Schaffer, 1896)	Ochman 2004, Pomorski 1992, Skalski 1973a, Stach 1939, Stach 1947
Lepidocyrtus albus Packard, 1873	Demel 1918, Stach 1919,
Lepidocyrtus cyaneus Tullberg, 1871	Pax and Maschke 1935
Lepidocyrtus lanuginosus (Gmelin, 1788)	Pax and Maschke 1935
Megalothorax incertus Börner, 1903	Ochman 2004, Pomorski 1992, Skalski 1973a
Megalothorax minimus Willem, 1900	Ochman 2004, Pomorski 1992, Pomorski 1996, Skalski 1973a, Stach 1939, Stach 1957
Mesachorutes ojcoviensis Stach, 1918	Skalski 1969, Skalski 1971, Skalski 1973a, Skalski 1981, Skalski 1994a, Skalski and Wójcik 1968, Stach 1919
Mesaphorura hylophila Rusek, 1982	Ochman 2004, Pomorski 1996
Mesaphorura krausbaueri Börner, 1901	Pomorski 1992, Skalski 1973a
Mesogastrura ojcoviensis Stach, 1919 [=*Troglogastrura ojcoviensis* ‡]	Demel 1918, Stach 1919, Stach 1949
Metaphorura affinis (Börner, 1903)	Pomorski 1996, Ochman 2004
Micranurida pygmaea Börner, 1901	Pomorski 1992, Pomorski 1996, Ochman 2004, Stach 1949
Neanura muscorum (Templeton 1835)	Pomorski 1992
Neelus murinus Folsom, 1896	Stach 1957
Oligaphorura schoetti (Lie-Pettersen, 1896)	Pomorski 1992, Skalski 1971
Oncopodura reyersdorfensis (Stach, 1936)	Pomorski 1992, Skalski 1971
Onychiurus ambulans (Linnaeus, 1758)	Skalski 1971
Onychiurus cebennarius Gisin, 1956	Pomorski 1992
Onychiurus denisi Stach, 1934	Kowalski 1955, Pomorski 1992, Stach 1939, Stach 1954

Species	References
Onychiurus fimetarius (Linnaeus, 1767)	Arndt 1921, Kowalski 1955, Pax and Maschke 1935, Skalski 1967, Stach 1954
Onychiurus granulosus Stach, 1930	Kowalski 1955, Ochman 2004, Pomorski 1992, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Stach 1939, Stach 1954
Onychiurus rectospinatus Stach, 1922	Stach 1954
Onychiurus sibiricus Tullberg, 1876 †	Kowalski 1955, Stach 1954
Onychiurus scotarius Gisin, 1954	Pomorski 1992
Onychiurus tuberculatus Moniez, 1891	Stach 1954
Pogononathellus flavescens (Tullberg, 1871)	Ochman 2004, Pomorski 1992
Pogonognathellus longicornis (Muller, 1776) [=*Tomocerus longicornis* Lubbock ‡]	Pax and Maschke 1935
Protaphorura alborufescens (Vogler, 1895) [=*Onychiurus alborufescens* ‡]	Skalski 1971, Skalski 1973a, Skalski 1973b, Skalski 1981, Skalski and Wójcik 1968
Proptaphorura armata (Tullberg, 1869) [=*Onychiurus armatus* ‡]	Arndt 1921, Demel 1918, Gubała 1996, Kowalski 1955, Ochman 2004, Pax and Maschke 1935, Pomorski 1992, Pomorski 1996, Skalski 1967, Skalski 1969, Skalski 1973a, Skalski 1981, Skalski and Wójcik 1968, Sobiepanek 1985, Stach 1919, Stach 1939, Stach 1954, Wołoszyn and Wójcik 1964
Protaphorura austriaca (Butschek, 1948)	Pomorski 1992
Protaphorura campata (Gisin, 1952)	Pomorski 1992
Protaphorura janosik Weiner, 1977	Weiner 1990
Pseudosinella alba (Packard, 1873)	Skalski 1973a
Pseudosinella petterseni Börner, 1901	Pomorski 1992
Pseudisotoma monochaeta (Kos, 1942)	Stach 1947
Pseudisotoma sensibilis (Tullberg, 1876)	Ochman 2004, Pomorski 1996
Schaefferia emucronata Absolon, 1900	Arndt 1921, Pomorski 1992, Skalski 1971, Stach 1939, Stach 1949
Sinella hoefti Schaeffer, 1896 †	Arndt 1921
Sminthurinus elegans (Fitch, 1863)	Ochman 2004, Skalski 1973a
Tetrodontophora bielanensis (Waga, 1842)	Arndt 1921, Kowalski 1955, Pax and Maschke 1935, Pomorski 1992
Tomocerus flavescens Tullberg, 1871	Kowalski 1955, Pax and Maschke 1935, Skalski 1973a, Skalski and Wójcik 1968, Stach 1939
Tomocerus minor (Lubbock, 1862)	Pomorski 1992
Tomocerus vulgaris (Tullberg, 1871)	Arndt 1921, Kur et al. 2016
Willemia intermedia Mills, 1934	Pomorski 1992
Willowsia buskii (Lubbock, 1870)	Ochman 2004, Pomorski 1996
Willowsia nigromaculata (Lubbock, 1873)	Ochman 2004, Pomorski 1996
Xenylla boerneri Axelson, 1905	Ochman 2004, Skalski 1973a
Xenylla brevicauda Tullberg, 1869	Stach 1949
Diplura:	
Campodea staphylinus Westwood, 1842	Arndt 1921
Chilopoda:	
Lithobius mutabilis Koch, 1862	Kowalski 1955
Blaniulus guttulatus (Fabricius, 1798)	Kur et al. 2016
Glomeris hexasticha Brandt, 1833	Kowalski 1955
Julus luscus Meinert, 1868	Arndt 1921
Leptoiulus trilobatus (Verhoeff, 1894)	Pax and Maschke 1935, Pax 1937
Mastigophorophyllon saxonicum Verhoeff, 1916	Pax and Maschke 1935
Mycogona germanica (Verhoeff, 1892) [= *Orthochordeuma germanica* ‡]	Pax and Maschke 1935, Pax 1937

Species	References
Ochogona caroli (Rothenbuhler, 1900) [= *Ceratosoma caroli* ‡]	Pax and Maschke 1935, Pax 1937
Strongylosoma stigmatosum stigmatosum (Eichwald, 1830)	Sobiepanek 1985
Symphyla:	
Scutigerella immaculata (Newport, 1845)	Kowalski 1955
Isopoda:	
Cylisticus convexus (De Geer, 1778)	Kur et al. 2016, Pax and Maschke 1935, Pax 1937, Skalski 1973a
Hyloniscus vividus (Koch, 1841)	Pax and Maschke 1935, Pax 1937
Mesoniscus graniger (Frivaldszky, 1865)	Piksa and Farkas 2007
Porcellio spinicornis Say, 1818	Skalski 1973a
Porcellio scaber Latreille, 1804	Wołoszyn and Wójcik 1964
Porcellium conspersum (Koch, 1841)	Pax and Maschke 1935
Protracheoniscus politus (Koch, 1841) [= *Porcellio politus* Koch, 1841 ‡]	Pax and Maschke 1935
Trachoniscus wachtleri	Kowalski 1955
Trachelipus affinis (Koch, 1841) [=*Trachelipus wächtleri* (Strouhal, 1951) ‡]	Skalski 1967
Oligochaeta:	
Achaeta eiseni (Vejdovsky, 1878)	Dumnicka 1977
Buchholzia appendiculata (Buchholz, 1862)	Dumnicka 1977, Skalski 1981
Dendrobaena alpina (Rosa, 1884)	Sobiepanek 1985
Dendrodrilus rubidus (Savigny, 1826) [=*Dendrobaena rubida* (Savigny, 1826)‡]	Dumnicka 1977
Enchytaeus polonicus Dumnicka, 1977	Dumnicka 1977, Skalski 1981, Skalski 1994a
Enchytraeus buchholzi Vejdovsky, 1878	Dumnicka 1977, Skalski 1981
Enchytraeus dominicae Dumnicka, 1976	Dumnicka 1977, Skalski 1981, Skalski 1994a
Fridericia bulbosa (Rosa, 1887)	Dumnicka 1977, Skalski 1981
Fredericia ratzeli (Eisen, 1872)	Kasprzak 1973
Henlea ventriculosa (d'Udekem, 1854)	Dumnicka 1977
Marionina argentea (Michaelsen, 1889)	Dumnicka 1977
Mollusca:	
Aegopinella nitens (Michaud, 1831)	Sobiepanek 1985
Arion subfuscus (Draparnaud, 1805)	Ochman 2004, Skalski 1973a, Sobiepanek 1985
Arianta arbustorum (Linnaeus, 1758)	Kowalski 1955
Armiger crista (Linnaeus, 1758) [= *Gyraulus crista*‡]	Wołoszyn and Wójcik 1964
Cepaea hortensis (Müller, 1774)	Skalski 1973a
Chilostoma cingulella Rossmässler, 1837 [=*Helicigona cingulella* ‡]	Kowalski 1955, Sobiepanek 1985
Chondrina clienta (Westerlund, 1883)	Kowalski 1955, Sobiepanek 1985
Clausilia dubia Draparnaud, 1805	Sobiepanek 1985
Cochlodina laminata (Montagu, 1803)	Skalski 1973a
Discus (*Gonyodiscus*) *rotundatus* (Müller, 1774)	Skalski 1973a
Helicella obvia (Menke, 1828)	Skalski 1973a
Helicigona faustina (Rossmässler, 1835)	Skalski 1973a
Helix pomatia Linnaeus, 1758	Pax and Maschke 1935
Isognomostoma isognomostomos (Schroter, 1784)	Skalski 1973a
Laciniaria plicata (Draparnaud, 1801)	Skalski 1973a
Lehmania marginata (Müller, 1774)	Sobiepanek 1985
Limax cinereoniger Wolf, 1803	Ochman 2004, Skalski 1973a
Monachoides incarnatus (Müller, 1774) [=*Perforatella incernata* ‡]	Skalski 1973a
Oxychillus glaber (Rossmässler, 1835)	Dumnicka and Płotek 2013, Ochman 2004, Skalski 1973a, Skalski 1981
Oxychilus depressus (Sterki, 1880)	Ochman 2004, Skalski 1973a, Skalski and Wójcik 1968

† – status of the species name is unclear, ‡ – name published in original paper

Summary

Based on presented data, it can be noticed that researchers' interest in terrestrial invertebrate fauna, both historically and contemporarily, is relatively low in Poland. In the span of 100 years, just over 50 published papers have been focused on the terrestrial invertebrate fauna of Polish caves although the presence of 593 species has been reported. Such a low interest could be caused by the conviction that it is not worth involving in the research of fauna that lacks spectacular troglobionts. Once the fauna of Polish caves gains greater interest of academics from various groups, we will learn more about this most mysterious world.

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